

# Edward Ajayi

+250795008889 | [✉ eaaajayi@andrew.cmu.edu](mailto:eaajayi@andrew.cmu.edu) | [🐙 GitHub](#) | [📄 Google Scholar](#)  
<https://edwardajayi.github.io/>

## EDUCATION

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### Carnegie Mellon University

Master of Science in Engineering Artificial Intelligence

Aug. 2024 – May. 2026

- **Relevant Courses:** Natural Language Processing, Deep Learning, Question Answering with LLMs
- **Specializations:** Data Science, Machine Learning, NLP
- **GPA:** 3.73/4.0

### Ekiti State University

Bachelor of Science in Computer Science

Oct. 2014 – Nov. 2019

- **Specializations:** Computer Science
- **GPA:** 4.17/5.0

## RESEARCH INTERESTS

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Language Modeling, AI Alignment and Evaluation, Representation Learning, Mechanistic Interpretability, Socially Aware AI

## SELECTED PUBLICATIONS

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1. **E. Ajayi**, M. Kachweka, M. Deku, and E. Aiken. *A Machine Learning Approach for Detection of Mental Health Conditions and Cyberbullying from Social Media*. *Proceedings of Machine Learning Research (PMLR), AAAI-26 AI in Medicine and Healthcare Bridge*. **Best Paper Award**. 2026. [[PMLR](#)]
2. **E. Ajayi** and P. Mitra. *HumorGen: Cognitive Synergy for LLM Humor Generation via Persona-Based Distillation*. Submitted to *EMNLP*. 2026. [[arXiv Preprint](#)]
3. **E. Ajayi** and P. Mitra. *HumorRank: An Automated Leaderboard for Evaluating Humor Generation in Large Language Models*. Submitted to *COLM*. 2026. [[Manuscript](#)]
4. **E. Ajayi** and P. Mitra. *Automatic Humor Detection: From Theoretical Foundations to Large Language Models*. Under Review. 2025. [[Manuscript](#)]
5. **E. Ajayi**, B. Tadele, E. Umwari, M. Deku, P. Singadi, C. Edeh, and J. Udahemuka. *Language Diversity: Evaluating AI Performance on African Languages*. 2025. [[arXiv Preprint](#)]
6. **E. Ajayi**. *AfriEconQA: A Benchmark Dataset for African Economic Analysis Based on World Bank Reports*. Under Review. 2026. [[arXiv Preprint](#)]

## EXPERIENCE

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### Research Associate

Spatial and Language Technologies Lab, Carnegie Mellon University Africa

Jun. 2026 – Present

- Building efficient multimodal humor generation models using LLMs and vision-language models (VLMs).
- Developing evaluation benchmarks for Large Language Models on subjective generation tasks and alignment.
- Conducting research on computational humor, multilingual NLP, and reasoning abilities of foundation models.

### Predoctoral Research Fellow

Human-Algorithm Interaction Lab, Oxford Saïd Business School, University of Oxford, UK

Feb. 2026 – May. 2026

- Conduct research on Human-AI collaboration, decision-making, and AI adoption in service systems at the Human-Algorithm Interaction Lab.

### Research Assistant

Spatial and Language Technologies Lab, CMU

Aug. 2025 – May. 2026

- Conducting research on NLP for automatic humour detection and generation, dataset preparation, model training, evaluation, and benchmarking.
- Contributing to multilingual and low-resource language technologies focused on culturally grounded language models.

### Research Intern - Business Automation

Carnegie Mellon University

Jun. 2025 – Aug. 2025

- Built an agentic AI workflow framework using LangGraph and FastAPI to automate complex business workflows.
- Researching and implementing AI safety protocols and robust LLM reasoning for ethical alignment and deployment.
- Analyzing agent performance to establish benchmarks for human-in-the-loop oversight and develop explainability metrics to support transparent corporate accountability.

### Client Service Officer

Stanbic IBTC Bank

Dec. 2021 – Jul. 2024

- Leveraged data-driven insights to cross-sell over N400M in assets, enhancing client trust and digital adoption by 25%.
- Managed client relationships, identifying service gaps to improve operational efficiency.

## TECHNICAL SKILLS

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**Languages:** Python, SQL, Bash

**Generative AI & LLMs:** LangGraph, OpenAI Agents SDK, RAG, LLM Fine-Tuning, Prompt Engineering, DPO

**Deep Learning & ML:** PyTorch, Hugging Face Transformers, Scikit-Learn, NumPy, Pandas, Matplotlib, Seaborn

**Natural Language Processing:** spaCy, NLTK, Sentiment Analysis, Text Processing

**Data Engineering & Ops:** Docker, AWS, FastAPI, Neo4j, BeautifulSoup, Jupyter

## SELECTED PROJECTS

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**HumorRank — LLM Evaluation & Ranking Framework** | *Python, Evaluation* [🌐 Leaderboard](#) [\[Paper\]](#)

- Developed a scalable evaluation framework for ranking outputs from multiple LLMs on subjective generation tasks.
- Implemented pairwise comparison with probabilistic ranking using the Bradley-Terry model.
- Designed a candidate generation → evaluation → leaderboard workflow for scalable benchmarking.

**HumorGen-7B — LLM-based Humor Generation Model** | *PyTorch, Transformers* [🔗 HuggingFace](#)

- Developed HumorGen-7B, a fine-tuned 7B language model for controlled humor generation.
- Implemented end-to-end alignment pipeline using supervised fine-tuning and Direct Preference Optimization (DPO).
- Implemented Cognitive Synergy framework to induce diverse reasoning paths for humor generation.

**MyTorch — Minimal Deep Learning Framework Built from Scratch** | *Python*

- Implemented core tensor operations, automatic differentiation, activation layers, and SGD without deep learning libraries.
- Designed a PyTorch-style API enabling end-to-end model training while illustrating neural network internals.
- Built modular components for educational experimentation with deep learning systems.

**Mental Health & Cyberbullying Detection System (AAAI Oral)** | *Transformers* [🔗 GitHub](#) [\[arXiv\]](#)

- Built an end-to-end multi-label classification system for detecting mental health signals and cyberbullying from social media data.
- Combined classical ML methods with transformer embeddings for robust prediction on noisy datasets.
- Produced results leading to an Oral paper acceptance at AAAI-26 AIMedHealth.

**AI Workflow Automation Agent** | *Python, LangChain, FastAPI*

- Built an autonomous agent to process submissions, route tasks, and trigger approval workflows.
- Integrated API orchestration, notifications, and real-time validation pipelines.

## TRAINING & CONFERENCES

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**Oral & Poster Presentation, AAAI Conference on Artificial Intelligence**

Singapore

*AAAI*

*Jan. 2026*

- Presented my paper on ML for mental health and cyberbullying detection from social media, and engaged with academics and researchers at the conference.

**Participant, Technical AI Safety Course**

Online

*Bluedot Impact*

*May 2025 – Present*

- Training in technical AI safety, focusing on alignment approaches, mechanistic interpretability, and catastrophic risk mitigation.

**Participant, Digital Humanities Summer School**

Rwanda

*DIGIHUM/CMU-Africa*

*Jul. 2025*

- Engaged in computational methods for humanities research, including NLP applications.

## VOLUNTEERING/LEADERSHIP

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**Founder & Organizer, CMU-Africa NLP Group**

*Carnegie Mellon University*

*Apr. 2025 – Present*

- Managing the group activities and overseeing research projects focused on language technologies.

**President, CMU-Africa Research Club**

*Carnegie Mellon University*

*Jan. 2025 – Dec. 2025*

- Led 12 major events in 2025 supporting student research.
- Launched website with research guides, conference updates, and collaboration hub.
- Organized first Student Research Showcase with 20+ posters and workshops.
- Collaborated with ACM SIGCOMM and Upanzi Network for remote conference participation on campus.
- Built an active research ecosystem that provided critical peer support, contributing to over 20 student acceptances to top-tier venues including NeurIPS and AAAI in 2025.

**Reviewer, AAAI AIMedHealth Bridge 2026**

*AI for Medicine and Healthcare*

*Nov. 2025 – Nov 2025*

- Reviewed submissions in applied machine learning and AI for healthcare under the AAAI AIMedHealth Bridge 2026 program.

## CERTIFICATIONS

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- Microsoft Certified Azure Data Scientist Associate - [View](#)
- DataCamp Python Data Associate - [View](#)

## HONORS AND AWARDS

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- Mastercard Foundation Scholarship, Carnegie Mellon University Africa
- Federal Scholarship Board Award for Undergraduates, Ekiti State University